

Melanoma and Hawaii's Youth

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Abstract

Hawaii's sandy beaches, warm crystal waters, and mild climate attract tourists and residents alike to enjoy hours of outdoor activities under the sun. As frequent participants of these sun related activities, Hawaii's youth are exposed to high levels and duration of ultraviolet radiation throughout their early lives. This study aims to define occurrence trends of cutaneous malignant melanoma in Hawaii in correlation to increased childhood ultraviolet exposure. This paper addresses trends in melanoma incidence during 1979-2002 for Hawaii residents < 25 years of age. Data obtained from this review were analyzed by age group and ethnicity. Results show that although the incidence of melanoma is increasing for Hawaii residents over 25 years of age, the rate of melanoma occurrence in Hawaii's youth (< 25 years) is not increasing.

Introduction

The sun is shining, the surf is three to six feet, and the beach is calling. It's another day in the sunny paradise we call Hawaii. As we pile the surfboards on the car, grab the sand chairs and head to the shoreline, we often forget to regard the intensity and potential danger of the warm sun on our shoulders. Ultraviolet radiation induced skin damage is a very significant risk factor in the development of cutaneous malignant melanoma (CMM), especially red blistering sunburns.¹ An estimated 65% of the melanoma cases worldwide are due to ultraviolet radiation.² Furthermore, sun exposure during early life has been found to be more influential on melanoma occurrence than exposures later in life.³ Several studies imply that melanoma skin cancers occurring in children and adolescents are more a result of sporadic childhood recreational sun exposure rather than cumulative damage.^{3,4} These studies suggest that childhood is a crucial period for sun exposure and potential future development of malignant melanoma. This study aims to define a correlation between the heavy sun exposure in Hawaii and the incidence of cutaneous melanoma in children and adolescents. Trends in incidence of melanoma in Hawaii for three different age groups (0-24 years, 25-49 years, and 50+ years) will be reviewed for the past three decades. In efforts to increase awareness of the potential hazard of UV exposure, this study highlights the importance of sun protection beginning in early childhood and continuing throughout life.

Methods

The Cancer Research Center of Hawaii provided case counts of reported cutaneous melanoma for all

ages in the years 1979-2002. Data obtained from this review was analyzed by age at diagnosis, ethnicity (white and other), and year of diagnosis. Cases were grouped by age groups: 0-24, 25-49, and 50+. Graphic representation of the study results were created using Microsoft Excel.

Results

Data shows that the incidence of cutaneous melanoma for the age group 0-24 years did not increase over the time period of 1979-2002. Case counts for this age group for year periods 1979-1986, 1987-1994, and 1995-2002 are 35, 39, and 38 respectively. However, case counts for the other age groups did increase over these years. For the age group 25-49, case counts increased from 342 in 1979-1986 to 536 in 1987-1994, and to 738 in 1995-2002. Similarly, case counts for age group 50+ increased drastically over the years. Case counts rose from 498 in 1979-1986 to 754 in 1987-1994. The case count number more than doubled for 50+ patients with melanoma in 1995-2002 to 1,643 cases. These trends are displayed in Figure 1.

Discussion

The incidence of malignant melanoma is increasing at a rate greater than that of any other cancer.⁵ Subjects younger than 20 years comprise only 2% of total melanoma cases, and only 0.2% of melanoma cases occur during the first decade of life.⁶ However, several studies worldwide have documented an increased incidence of cutaneous melanoma in patients < 20 years of age. The Surveillance Epidemiology and End Results Program data suggests an 85% increase in incidence of melanoma for 15-19 year olds between 1973 and 1996.⁷ A study done through the Swedish National Cancer Registry on children between 12-19 years of age showed an increase in mean annual incidence rate of 0.2/100,000 in 1973-82 to 0.5/100,000 in 1983-92.⁶ Research through England's Northern Region Young Person's Malignant Disease Registry between 1968-1995 showed an increase of 5.6 per million per decade for females under 25 years of age.⁷ Furthermore, in Queensland, Australia (where there is the highest recorded incidence of melanoma worldwide), childhood rates of melanoma are found to be as high as 7 per million children per year and increasing.⁸

Melanoma trends in the young residents of Hawaii have not mirrored this world wide trend in increasing melanoma incidence. Information from the Cancer Research Center of Hawaii indicates that the case

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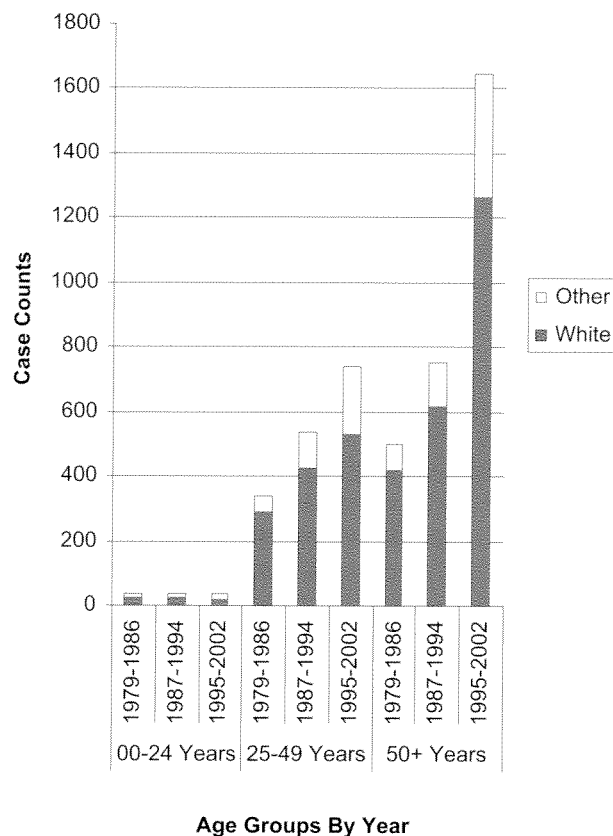


Figure 1.— Melanoma Cases in Hawaii 1979-2002

counts of melanoma diagnoses in patients under 25 years of age has remained relatively stable over the years 1979-2002. This may be due to a higher percentage of Hawaii's population with darker pigmented skin, which is less susceptible to melanoma development, especially during young adulthood. Unfortunately, the older age groups in this study have experienced significant increase in the diagnosis of melanoma. Perhaps these numbers more accurately reflect the impact of increased childhood sun exposure for Hawaii's residents.

Several factors contribute to the development of CMM including family history, conditions such as dysplastic nevus syndrome, congenital nevi, skin pigmentation, and sun exposure. Xeroderma pigmentosum and immunosuppressive therapy are additional infrequent risk factors for melanoma in childhood.⁹ Several researchers have attributed the rising incidence of melanoma in children and adolescence worldwide to changes in sun related behavior and increased ultraviolet exposure.^{3,6,5,7} Although the carcinogenicity of ultraviolet radiation is well confirmed, the significance of the timing of exposure is less understood.¹⁰ Several studies to date support the hypothesis that childhood UV exposure is much more contributory to the development of cutaneous melanoma as compared to adulthood UV exposure.^{3,7} Research by Weinstock et al. in 1989 suggests UV exposure occurring before 20 years of age is more influential on development of melanoma than sun exposures later in life.³ Concurrently, Autier et al, 1996, reported that sun protection early in life reduces the probability of melanoma in adulthood.³

The increasing incidence of melanoma in youth nationwide and worldwide most likely reflect increased exposure of ultraviolet radiation as well as different sun related practices. It has been estimated that children spend 2.5 to 3 hours in the sun daily, receiving 3 times more annual UV-B radiation than adults.¹ In Hawaii, it is likely that children spend even more than this estimated amount doing outdoor

activities. As previously mentioned, these early years of sun exposure are critical to the development of future skin cancer. A large cross-sectional study including all 50 states in the US found that only one third of respondents ages 12-18 years reported routine use of sunscreen during summer activities.¹ An overwhelming 83% of test subjects reported at least one sunburn during the summer.¹ Although the female subjects of this study used sunscreen more routinely than males, females were more likely to have received at least three sunburns during the summer and to state that it was worth burning to get a good tan.¹ A total of 10% of respondents reported tanning bed use, and as many as 25% of females subjects ages 15-18 reported tanning bed use.¹ This astounding national data displays the poor sun protective behaviors currently practiced by children and adolescents.

Conclusion

Lack of routine sunscreen use, frequent sun burning, tanning, and tanning booth use are strong contributors to development of skin cancers, and likely account for the climbing trends of melanoma worldwide. Fortunately, Hawaii's youth have not experienced this increase in diagnosis of melanoma. However, Hawaii's older residents have, which may more accurately reflect increased sun exposure during childhood. These increasing trends demonstrate a lack of awareness of the importance of sun protective behavior and sun avoidance. Educating youth and adults alike about the dangers of the sun is a necessity in reversing these trends, especially in our sunny state of Hawaii. Sun protective behaviors as well as other health practices are established early in life and likely carry over into adulthood, stressing the importance of early education.¹ We must support and expand our local programs in Hawaii to increase sun awareness and decrease the occurrence of cutaneous melanoma.

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